

EFFECTS OF HEALTH LITERACY ON MEDICATION ADHERENCE AMONG PATIENTS WITH GLAUCOMA IN TWO OPHTHALMIC CLINICS IN OYO STATE

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ABSTRACT

Patients as the major users of medication play an important role in the medication adherence. Specifically the study investigated the effect of health literacy on medication adherence among patients with glaucoma in two ophthalmic clinics in Oyo State. This study sought to ascertain the reasons why patients with glaucoma do not adhere to proper medication and also assessed the health literacy level of patients with glaucoma before and after health literacy intervention. The experimental research design was adopted and population consisted of 55 patients with glaucoma patient. Major research instrument was a standard Medication Adherence Tool. Data were analysed using frequency, percentage, mean, standard deviation, paired “t” test at 0.05 significance level. The major findings of the study revealed that the majority of the patients with glaucoma in Oyo State were male within age group of 31-40years and traders were mainly secondary school leavers. Results also showed that majority of respondents patients were Muslim and earned below thirty thousand naira (N30, 000) monthly. Results of pre intervention showed that the subjects had inadequate health literacy level on medication adherence but had an improved knowledge after intervention. The results further showed that there is significant difference ($P < 0.004$) between pre- and post- test health literacy scores of respondents on medication adherence after administering structured literacy programmes. The mean post test score was 81% which was significantly higher than the pre-test score of 39%, the difference in the mean enhancement score was observed as 42%. Also, Paired “t” value of post-test of the patients were find to be significant at $P < 0.05$. It was also revealed that the health literacy intervention programme for the respondents had significant effect on their medication adherence in Oyo State.

In conclusion, the study shows that health literacy intervention of medication adherence is an effective strategy to improve medication adherence of patients with glaucoma in the state.

KEYWORDS: Major Research Instrument, Analysed Using Frequency, Health Literacy

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INTRODUCTION

In healthcare sector, patients commonly struggle to understand clinical information on medication due to low literacy skills. This poses specific challenges for patients who have low literacy skills as they have fewer means to either improve their health literacy or recall health advice due to inability to read written materials. Health literacy is the ability to obtain process and understand health information to make informed decisions about

health care (National Institute of Health, 2012). Health literacy relates to the possession of knowledge about health and serves as a skill-based process that individual use to identify and transform health information into knowledge. Patients with low health and general literacy skills may have poorer health, higher expenses for healthcare, higher rate of hospitalization, lower self-efficacy for preventive care practices and poor adherence to medication (Rootman and Ronson, 2005; World Health Organisation, 2008). Health literacy skills are not bound to race or age, though the study of Omolase et al (2012) stated that 51% majority of the population in Nigeria have insufficient health literacy skills. This range of proportions of Nigerians with low literacy led to poor adherence to medication and recommendation, which therefore contribute to a reduction in the effectiveness and efficiency of health care interventions in the country. Health literacy problems have grown as clinicians and health care providers expect patients to assume more responsibility for their care at a time when the health care system is progressively more fragmented, complex and technologically sophisticated. In the view of Rudd, Anderson, Oppenheimer and Nath (2007), the complexity of written and verbal health information and the shortage of health information in languages other than English make it difficult for patients with low general literacy skills. Results of studies point out that a majority of printed medication materials require relatively high literacy skills (Green, 2007). In Nigeria healthcare sector, the stance of healthcare providers towards health literacy varies across different healthcare services. Health written information such as treatment sheet, medication materials, appointment cards, diagnostic or investigation reports are commonly provided in English for patients. As a result of that, patients usually experience different challenges when it comes to applying knowledge on prescribed medications, and this lead to noncompliance on the part of patients to adhere to proper medications. As stated earlier, health literacy skills are not bound to race or age as well as the economic status of patients. Health literacy problem are particularly rampant among patients receiving treatment for glaucoma. Patients with glaucoma, as observed by Resnikoff et al (2004), are the people that have disease of the eye and this problem is a major cause of irreversible blindness worldwide. Glaucoma is a major public health problem despite available diagnostic measures. In the study conducted by Allmark. and Tod (2005), it is estimated that 4.5 million people are currently blind due to glaucoma making it second to cataract which account for 50 million blindness worldwide. Addressing avoidable blindness in Nigeria had mainly focused on age related cataracts and refractive errors as these are the two main causes of avoidable blindness in Nigeria. It has been shown by the results of several studies that despite the growing interest of the government and health care providers in improving the quality of care in Nigerian health system, high level of blindness caused by glaucoma is still a major public health challenge in the country, particularly in Oyo State (Oladehinde, *et al*, 2007; Adekoya *et al*, 2009; Adio and Onua, 2012; Omolase *et al*, 2012). There are 45 million people who are currently blind in the world and 90% of these are from developing countries (Allmark and Tod, 2005). In Nigeria, a total of 4.3 million adults aged 40 years and above are blind; and of these, 3.5% are from Southwest, 7.9% from North East and 28.6% from North West geopolitical zones (National Institute of Health, 2012). In Oyo State, an estimated 3.3% of the above ages are blind; out of these, females have a higher number of blindness than males, and the illiterates have higher number of blindness than those who could read and write. Glaucoma was the second after cataract commonest cause of blindness as it is responsible for 16.7% of blindness (Enoch et al, 2010). One of the major factors identified as being responsible for this worrisome situation is poor medication adherence of patients with glaucoma. This could be traceable to low literacy skill. Glaucoma has a direct effect on the economy of the nation in terms of negligible contribution of the affected persons to the economy (Adekoya et al, 2009 and Omolase et al, 2012). Results of several studies have linked low health literacy skill with the increase in the burden of glaucoma problem and other eye related diseases being experienced worldwide (Nwosu et al, 1991; Downs, et al., 2001; Nicolaou et al, 2005 and Oladehinde et al,

2007). However, there is dearth of information on improvement of health literacy for patients with glaucoma. This category of patients too needs scholarly attention on ways to improve their health literacy level. Therefore, to improve the quality of healthcare and reduce healthcare cost, there is need for more active role on the part of attending nurses to ensure health literacy skill of glaucoma patients at all times. It is based on this that the current study was conducted to investigate the influence of health literacy on medication adherence among patients with glaucoma in two ophthalmic clinics in Oyo State.

Conceptual Framework

In this study, the focal stimulus that immediately confronts the patient with glaucoma include patient’s perception on the duration of their medication. The contextual stimuli are all other stimuli is adhere to medication and this is influenced by demographic data such as sex, age, marital status, educational level, income and length of time since diagnosis. Other stimuli are termed ‘residual stimuli’ and these are unknown factors.

Conceptual Framework of Patient with Glaucoma to Medication Adherence

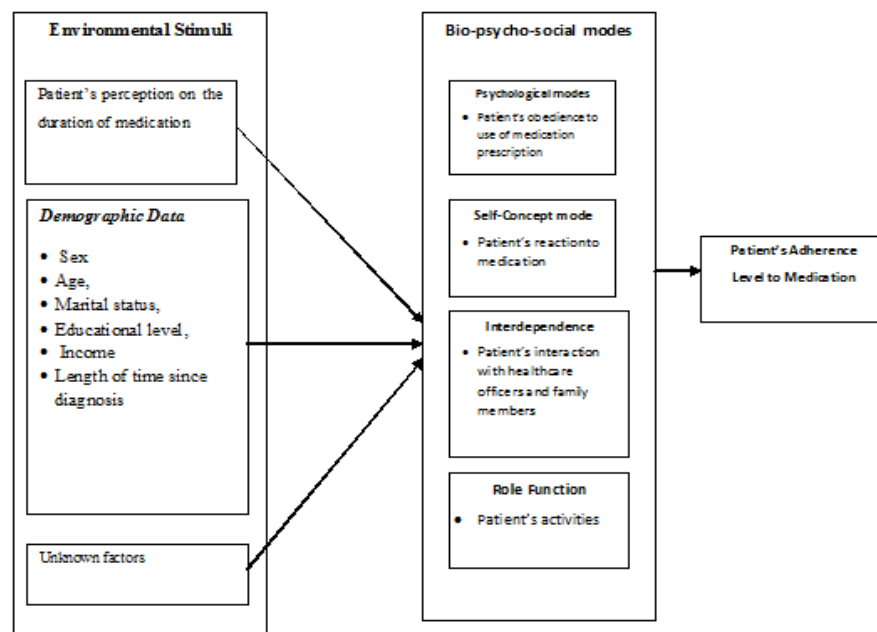


Figure 1

MATERIAL AND METHODS

The Ring Road State Hospital was used as the study setting. The hospital is located in the Southwest Local Government Area of Ibadan and it is under the control of Oyo State Hospitals’ Management Board. The sample for the study comprised only patients with glaucoma receiving treatment at the hospital. According to patients’ register available at the hospital, 600 patients with glaucoma received treatment in 2013 (SMOH M&E, 2014). 55 patients that registered for treatment in the month of July, 2014 were purposely selected as study sample. This study employs experimental research design in which experimental and control groups were used. The two groups were subjected to a pre-tests and results were compared. The first group which was the experimental (Ox) group was then exposed to experimental treatment on health literacy intervention programme while the control (NOx) group which was not. Then two groups were then subjected to a post-test, and results were compared.

Literacy Intervention Design for Patients with Glaucoma

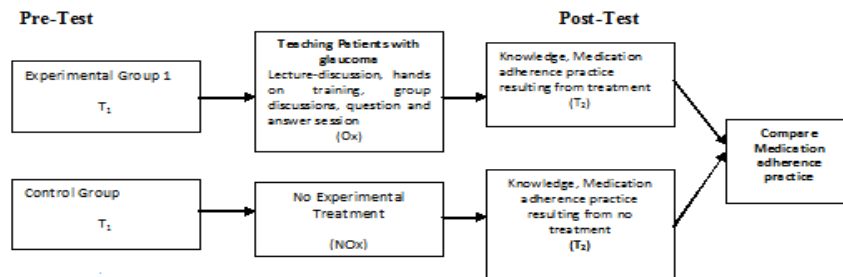


Figure 2

Key:**T₁**: Pre-intervention test (pre-test)**Ox**: Experimental treatment (intervention)**NOx**: No experimental treatment**T₂**: Post intervention test (post-test)

The intervention programme includes teaching methodology which involved group discussion and individual/group tasks. Pictorial aids labels was also used to improve patient understanding of medication instructions, taking medications as instructed, reducing medication errors, reducing poor health outcomes, and improving patient safety and quality of healthcare for the experimental group. In addition, respondents were given customized pictorial aids calendar in English for taking home for study at leisure time. The customized pictorial aids calendar comprised pictures that indicate respondents' functions. The customized pictorial aids calendar also indicated when to take medications by using pictures that symbolize morning, afternoon, evening and bed-time. The exercise was believed to have positive change on patients' beliefs and behavior to medication use. A standard Morisky Scale with ten-item was used to assess each patient's understanding of the need for medications, how to take them, and the level of adherence with the prescribed protocol. This tool was used for obtaining information before (pre-test) and after intervention (post-test). Also, the items in this tool were translated into Yoruba language. Then, patients were rated on their perceived comprehension of a 10-point scale (non-adherence to adherence) at pre-intervention. During pre-test, after seeking the cooperation and consent of the participants, researchers addressed the participants by explaining the importance of the research. The Medication adherence tool was numbered and administered to the participants after explaining how to complete the test.

According to the hospital rule, the Ophthalmic Clinic Day is Monday and Wednesday (i.e. two days in a week). Therefore, health literacy intervention on medication adherence was carried out for eight (8) working days within the month of July, 2014. The intervention passed through the following stages: simplifying regimen, knowledge impartation, modification of patients' beliefs and behavior, provision means of communication and subjects' adherence was evaluated. Also, Health Literacy Manual was used. The content was delivered in lectures, group discussions, individual tasks and role plays.

Post-test was administered to the sample 2 weeks after the health literacy intervention. Ethical clearance was obtained through the ethical committee of the State Ministry of Health. The data obtained was then analysed using simple statistical methods such as frequencies, percentage, mean, means and standard deviation.

RESULTS AND DISCUSSION OF FINDINGS

The result showed that majority of patients - 36.4% were in age bracket 31-40years and 69% were males. It was also shown that 30.9% of the respondents were school certificate holders and just 12.7% of them were university graduates. Occupational distribution revealed that 47.3% respondents were traders, 32.7% civil servants and 20% were private workers.

The result showed the family income of the respondents ranged from N10,000 to N60,000 with a mean N38,000 ± N5,240. This is well represented in figure 1.



Figure 3: Distribution of Respondents by Income

Pre-intervention results on the health literacy of the subjects were shown in table 1 and 2.

Table 1: Aspect Wise Mean Pre-Test Health Literacy Level Scores of Patients with Glaucoma on Medication Adherence N=55

S/N	Literacy Aspects	Items	Max. Score	Health Literacy score		
				Mean	Mean(%)	S.D
I	Section 1	18	18	7.3	40%	3.4
II	Section 2	8	8	2.5	31%	1.8
III	Section 3	9	4.9	4.2	46%	3.0
IV	Section 4	6	6	2.1	35%	1.8
	Combined	41	41	16.1	39%	8.6

Table 2: Pre-Test Health Literacy Level of Patients with Glaucoma on Medication Adherence before Intervention N=55

S/No.	Health Literacy Level	Category	Frequency and Percentage of Respondents	
			Pre-Test	
			N	%
1	Inadequate	<50% score	36	65.5
2	Moderate	51-75% score	19	34.5
3	Adequate	>75% score	0	0
	Total		55	100

Table 1 showed the aspect wise mean pre-test health literacy level of patients with glaucoma regarding medication adherence. The health literacy score was 40% in the aspect of section 1, 31% in the aspect of section 2, 46% in the aspect of section 3, 35% in the aspect of Section 4. The illustration on Table 2 reveals the literacy level of patients with glaucoma on medication adherence before the intervention. In the pre-test health literacy level, it was revealed that 36 respondents representing 65.5% had inadequate health literacy level on medication adherence while 19 (34.5%) of the respondents had moderate literacy level. This implies that, the greater number of the patients with glaucoma sampled for this study during pre-test had less than 50 score which represent “inadequate” health literacy level on medication adherence. This result is supported by Ownby, Waldrop-Valverde, Caballero and Jacobs (2012) who classified a total score less than 59 to be “inadequate” health literacy, scores in the range from 60–74 “marginal” and greater than 75 “adequate” health literacy.

Lezak, Howieson and Loring (2004) also supported that patients' levels of health literacy can be interpreted according to the cutoff values provided by its author. Bosworth (2010) supported that patients who score below an accepted threshold on health literacy reference standards are described variably as having low, limited, or inadequate literacy.

Assessments of health literacy level of patients with glaucoma on medication adherence after intervention were revealed in table 3 and 4.

Table 3: Aspect Wise Mean Post-Test Health Literacy Score of Patients with Glaucoma N=55

S/N	Literacy Aspects	Items	Max. Score	Health Literacy score		
				Mean	Mean (%)	S.D
I	Section 1	18	18	15.2	85%	1.8
II	Section 2	8	8	5.9	74%	4.2
III	Section 3	9	9	7.0	78%	1.1
IV	Section 4	6	6	5.1	85%	0.9
	Combined	41	41	33.2	81%	3.1

Table 4: Post-Test Health Literacy Level on Medication Adherence of Patients with Glaucoma N=55

S/No.	Health Literacy Level	Category	Frequency and Percentage of Respondents	
			Pre-Test	
			N	%
1	Inadequate	<50% score	0	0
2	Moderate	51-75% score	10	18.2
3	Adequate	>75% score	45	81.8
	Total		55	100

The table 3 revealed the aspect wise post-test mean health literacy level of patient with glaucoma on medication after intervention. Health literacy score was 85% in the aspect of section 1, 74% in the aspect of section 2, 78% in the aspect of section 3 and 85% in the aspect of section 4. The illustration in Table 4 shows the classification of patients with glaucoma on post-test health literacy level on medication adherence. In the post-test health literacy level, it was discerned that 45 (81.8%) of the respondents had adequate health literacy level and 10 (18.2%) of the respondents had moderate health literacy. This signified that almost all the patients with glaucoma sampled for this study had adequate health literacy on medication adherence after intervention. This result is in consonance with the study of Ponnusankar et al. (2004) who found after intervention, 67% of patients in the intervention group had increased medication knowledge and concluded that medication education increased compliance in the intervention group after assessment. Similarly, Kripalani et al. (2007) who conducted a randomized control trial (RCT) to develop a low-literacy patient education tool by using a *pill card* intervention found 94% of all patient groups reported in literacy level. Ownby et al (2012) also found greater increase in the level of numeracy of HIV patients after completing the intervention.

Effectiveness of Structured Teaching Modules on Medication Adherence among Patients with Glaucoma were revealed in

Table 5: Aspect Wise Effectiveness of Structured Teaching Modules on Medication Adherence among Patients with Glaucoma N=55

S/N	Literacy Aspect	Patients Health Literacy Score						Paired 't' test
		Pre-test		Post-test		Enhancement		
		Mean%	S.D	Mean%	S.D	Mean%	S.D	
1	Section 1	40%	3.4	85%	1.8	45%	1.6	13.52
2	Section 2	31%	1.8	74%	4.2	43%	2.4	11.60

Table 5: Contd.,

3	Section 3	46%	3.0	78%	1.1	32%	1.9	6.03
4	Section 4	35%	1.8	85%	0.9	50.0%	0.9	9.98
	Combined	39%	8.6	81.0%	3.1	38.66	0.82	12.01

*Significant $t(0.05, 39df) = 12.01$

Table 6: T-Test Analysis of Health Literacy Level of Patients With Glaucoma Before and After Intervention on Medication Adherence N=55

Aspects	Statements	Health Literacy score			Paired 't' test
		Mean	Mean (%)	S.D	
Pre-test	41	16.1	39%	8.6	12.01*
Post-test	41	33.2	81%	3.1	
Enhancement	41	17.1	42%	10.6	

*Sig. at 0.05

Table 5 gives a clear picture of overall all health literacy score component wise pre-test and post-test. In the pre-test, health literacy score was considerably less compared to post-test performance in all the aspect under study. The findings showed that the enhancement mean percent score in the aspect of section 1 was 45%, 43% in aspect of section 2, 32% in aspect of section 3, 50% in the aspect of section 4. Table 6 revealed that the mean post-test score was 81% which was significantly higher than the pre-test score of 39%, the difference in the mean enhancement score was observed as 42%. This indicates significant difference between pre-test and post-test health literacy scores of patients with glaucoma. This is in consonance with the study of Joveena (2012) who found significant difference between pre and post-test knowledge scores of psoriasis patient on PUVA therapy after administering structured teaching programme. On the other hand, the paired "t" value of 12.01 pre- and post-test of the patients with glaucoma were found to be significant at $p < 0.05$. Statistically, the findings deduced that there is significant difference between the health literacy level of patients with glaucoma on medication adherence before and after intervention.

Table 7: ANCOVA for Post Means of Patient Health Literacy on Medication Adherence after Intervention

Source	Sum of squares	df	Mean square	F	Sig. Level
Pre-test	656.548	1	656.648	52.611*	0.000
Control	127.021	1	42.340	22.355*	0.000
Error	104.170	53	1.894		
Total	887.739	55			

*indicates significance

In order to examine whether health literacy level of the two groups differed from each other, analysis of covariance was carried out in table 7 to determine the significant difference between experimental and the control group on the medication adherence after adjusting for the pretest differences with the experimental treatment. The mean square of the experimental group was 656.65, greater than the 42.34 for the control group. Therefore, the health literacy intervention for patient with glaucoma had a significant effect on their medication adherence.

Implications of the Study

Nurses are key persons in the health team and they play major role in health promotion and maintenance. This study, conducted among patients with glaucoma in Oyo State could serve as a valuable reference material for future investigators. The study could be replicated for patients with other eye problems in the state and such studies could determine the extent to which health literacy intervention influence medication adherence of patients in the state. Also,

further research is conducted to minimize the side effects of glaucoma in the state.

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